

ABSTRACT

[1061] An N-FET headswitch has improved performance (e.g., less leakage current, lower ON resistance, and smaller area) over a conventional P-FET headswitch. The N-FET headswitch includes at least one N-FET device and couples between a power supply and a load circuit, which may be, e.g., a microprocessor, a digital signal processor, or a memory unit. The headswitch couples the power supply to the load circuit when the headswitch is enabled and cuts off the power supply from the load circuit when disabled. A charge pump couples to the headswitch and provides a control signal. This control signal is sufficiently high when the headswitch is enabled to ensure that the N-FET device operates in a linear region and has a small drain to source voltage drop. The headswitch may be operated as a power switch or in a feedback configuration to implement a linear or a digital voltage regulator.